

## CLAIMS:

1. A transmission system for transmitting an information signal via a plurality of subchannels from a transmitter to a receiver, the transmitter comprising:
  - a demultiplexer for demultiplexing the information signal into a plurality of information subsignals in dependence on a throughput of the subchannels as ordered by the receiver;
  - an encoder for encoding input symbols of the information subsignals into output symbols such that  $k$  input symbols of the  $k$ -th information subsignal are encoded with a  $k \times m$ -code into  $m$  output symbols,  $1 \leq k \leq m$ , said code having the following properties:
    - all  $k$  input symbols and all  $m-k$  other output symbols are determinable from any  $k$  output symbols, and
    - no  $m-l$  other output symbols are determinable from any  $l$  output symbols,  $l < k$ ;
    - a multiplexer for multiplexing the output symbols into output information subsignals;
  - a channel encoder for channel encoding the output information subsignals into encoded information subsignals;
  - and means for transmitting each encoded information subsignal via one of the subchannels to the receiver;
- the receiver comprising:
  - means for receiving the encoded information subsignals;
  - a channel decoder for successively channel decoding the received encoded information subsignals into channel decoded information subsignals by incorporating decoding information of already channel decoded information subsignals;
  - a demultiplexer for demultiplexing the channel decoded information subsignals into channel decoded symbols;
  - a decoder for decoding the channel decoded symbols into decoded output symbols and for supplying the decoding information regarding the decoded output symbols to the channel decoder;

- a further multiplexer for multiplexing the decoded output symbols into an output information signal.

2. The transmission system according to claim 1, wherein the code is a maximum distance separable (MDS) code.

3. The transmission system according to claim 1 or 2, wherein the transmitter further comprises an interleaver coupled between the multiplexer and the channel encoder, the interleaver being arranged for interleaving the output information subsignals, wherein the channel encoder is arranged for encoding the interleaved output information subsignals into the encoded information subsignals.

4. The transmission system according to any one of claims 1 to 3, wherein the channel decoder is arranged for decoding a received encoded information subsignal by incorporating decoding information of the most recently channel decoded information subsignal.

5. The transmission system according to any one of claims 1 to 4, wherein the transmission system is a binary transmission system and wherein the information subsignals comprise differently routed binary signals.

6. The transmission system according to any one of claims 1 to 4, wherein the transmission system is a wireless communication system, and wherein the transmitter comprises a plurality of transmit antennas, wherein each channel encoded information subsignal is transmitted via one of the transmit antennas to the receiver, and wherein the receiver comprises a plurality of receive antennas for receiving the encoded information subsignals.

7. A transmitter for transmitting an information signal via a plurality of subchannels to a receiver, the transmitter comprising:

- a demultiplexer for demultiplexing the information signal into a plurality of information subsignals in dependence on a throughput of the subchannels as ordered by the receiver;

- an encoder for encoding input symbols of the information subsignals into output symbols such that  $k$  input symbols of the  $k$ -th information subsignal are encoded with a  $k \times m$ -code into  $m$  output symbols,  $1 \leq k \leq m$ , said code having the following properties:
  - all  $k$  input symbols and all  $m-k$  other output symbols are determinable from any  $k$  output symbols, and
  - no  $m-l$  other output symbols are determinable from any  $l$  output symbols,  $l < k$ ;
  - a multiplexer for multiplexing the output symbols into output information subsignals;
- 10 - a channel encoder for channel encoding the output information subsignals into encoded information subsignals;
  - and means for transmitting each encoded information subsignal via one of the subchannels to the receiver.
- 15 8. The transmitter according to claim 7, wherein the code is a maximum distance separable (MDS) code.
- 9. The transmitter according to claim 7 or 8, wherein the transmitter further comprises an interleaver coupled between the multiplexer and the channel encoder, the  
20 interleaver being arranged for interleaving the output information subsignals, wherein the channel encoder is arranged for encoding the interleaved output information subsignals into the encoded information subsignals.
- 10. The transmitter according to any one of claims 7 to 9, wherein the transmitter  
25 comprises a plurality of transmit antennas, and wherein each channel encoded information subsignal is transmitted via one of the transmit antennas to the receiver.
- 11. A receiver for receiving encoded information subsignals via a plurality of subchannels from a transmitter, the encoded information subsignals being encoded with a  
30  $k \times m$ -code, said code having the following properties:
  - $k$  input symbols are encoded into  $m$  output symbols,  $1 \leq k \leq m$ ,
  - all  $k$  input symbols and all  $m-k$  other output symbols are determinable from any  $k$  output symbols, and

- no  $m-l$  other output symbols are determinable from any  $l$  output symbols,  
 $l < k$ ;

the receiver comprising:

- means for receiving the encoded information subsignals;
- 5 - a channel decoder for successively channel decoding the received encoded information subsignals into channel decoded information subsignals by incorporating decoding information of already channel decoded information subsignals;
- a demultiplexer for demultiplexing the channel decoded information subsignals into channel decoded symbols;
- 10 - a decoder for decoding the channel decoded symbols into decoded output symbols and for supplying the decoding information regarding the decoded output symbols to the channel decoder;
- a multiplexer for multiplexing the decoded output symbols into an output information signal.

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12. The receiver according to claim 11, wherein the code is a maximum distance separable (MDS) code.

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13. The receiver according to claim 11 or 12, wherein the channel decoder is arranged for decoding a received encoded information subsignal by incorporating decoding information of the most recently channel decoded information subsignal.

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14. The receiver according to any one of claims 11 to 13, wherein the receiver comprises a plurality of receive antennas for receiving the encoded information subsignals.

15. A method of transmitting an information signal via a plurality of subchannels to a receiver, the method comprising:

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- demultiplexing the information signal into a plurality of information subsignals in dependence on a throughput of the subchannels as ordered by the receiver;
- encoding input symbols of the information subsignals into output symbols such that  $k$  input symbols of the  $k$ -th information subsignal are encoded with a  $k \times m$ -code into  $m$  output symbols,  $1 \leq k \leq m$ , said code having the following properties:
  - all  $k$  input symbols and all  $m-k$  other output symbols are determinable from any  $k$  output symbols, and

- no  $m-l$  other output symbols are determinable from any  $l$  output symbols,  
 $l < k$ ;
  - multiplexing the output symbols into output information subsignals;
  - channel encoding the output information subsignals into encoded information  
5 subsignals;
  - transmitting each encoded information subsignal via one of the subchannels to  
the receiver.
16. The method of transmitting according to claim 15, wherein the code is a  
10 maximum distance separable (MDS) code.
17. A method of receiving encoded information subsignals via a plurality of  
subchannels from a transmitter, the encoded information subsignals being encoded with a  
 $k \times m$ -code, said code having the following properties:
- 15 -  $k$  input symbols are encoded into  $m$  output symbols,  $1 \leq k \leq m$ ,
  - all  $k$  input symbols and all  $m-k$  other output symbols are determinable from  
any  $k$  output symbols, and
  - no  $m-l$  other output symbols are determinable from any  $l$  output symbols,  
 $l < k$ ;
- 20 the method comprising:
- receiving the encoded information subsignals;
  - successively channel decoding the received encoded information subsignals  
into channel decoded information subsignals by incorporating decoding information of  
already channel decoded information subsignals;
- 25 - demultiplexing the channel decoded information subsignals into channel  
decoded symbols;
- decoding the channel decoded symbols into decoded output symbols and for  
supplying the decoding information regarding the decoded output symbols to the channel  
decoder;
- 30 - multiplexing the decoded output symbols into an output information signal.